experienced the retreating southerly winds, force 7, of this storm, and checked speed to avoid possible trouble. But two days later, while en route toward China, in 33° 06′ N., 136° 30′ E., she ran into an easterly gale, force 10, of another typhoon, in which she hove to from 7 a. m. of the 20th until 5.30 p. m. of the 21st.

Further discussion of the storms of this region is found in the article by the Rev. José Coronas, S. J., at the end of this section.

In Mexican coast waters an apparently small and only moderately intense tropical cyclone occurred on the 16th. On that date the American steamer *Maricos H. Whittier* experienced a SE. wind, force 7, in 17° 15′ N., 106° 02′ W., at 6 a. m. At 5 p. m. the Canadian steamer *Vancolite*, northward bound, ran into a moderate gale, "wind increasing in squalls to force 9, ESE., barometer 29.79, heavy sea, vessel pitching and straining heavily, and shipping heavy water." This was in 18° 51′ N., 105° 27′ W.

The American steamer *West Calera*, Sydney, N. S. W., to San Francisco, reports a gale which, on account of its position and its attendant barometric depression, is of interest. The following is the account by the observer, Mr. A. Skjellerup.

On July 31, 1925, in latitude 15° 20′ N., longitude 152° 12′ W., encountered severe gale commencing at 2 p. m. with showers, squalls, and heavy swell from NE. The wind remained steady in direction and gradually increased till 7 a. m., August 1, when it reached force 9. Overcast and raining. At 11 a. m. wind veered to east, easing gradually from then to force 5 at 7 p. m. At 2 p. m., 31st, the barometer was 29.88, falling gradually till 6 a. m., 1st, when it was 29.74, from then commencing to rise slowly, reading 29.92 at 7 p. m.

Except as noted above, few and inconsequential gales seem to have occurred along the great northern steamship routes.

Fog, as in July, was frequent and heavy in upper latitudes, and several vessels en route there reported a continuance of it for days at a time. It also was observed on several dates along practically the entire American coast from northern Alaska to near Cape San Lucas.

American S. S. "Mexican," Canal to Los Angeles.—August 14, 12 noon, in 16° 12′ N., 99° 15′ W., passed a very large waterspout about 2 miles off. Two smaller ones near by had either just broken up, or were just about to form. Gentle E. breeze, cloudy (A.-Cu. and Cu.-Nb.), barometer 29.89, temperature of air 84°, of sea 78°.

INDIAN OCEAN

Observations covering a considerable part of August indicate that the southwest monsoon was especially strong in the Arabian Sea, being of force 8 on several days. The American steamer *Ensley City*, Shanghai to Calcutta, from August 2 to 16, reported "SW. monsoon winds very regular in south China Sea and Bay of Bengal, especially strong in latter."—*W. E. H.*

TWO JAPAN AND ONE FORMOSA TYPHOONS, IN AUGUST, 1925

By Rev. José Coronas, S. J.

[Weather Bureau, Manila, P. I.]

Although the rainfall in the Philippines during the past month of August has been quite above the normal, yet there was no real typhoon over the Philippine Archipelago in the whole month but only a low-pressure area covering the northern part of Luzon on the 29th. Three severe typhoons, however, were shown by our Weather Maps over the Far East, two over or near Japan and one close to north Formosa, although only that of Formosa influenced the weather in the Philippines. There was another typhoon near Guam at the end of the month, but its track belongs rather to the month of September. The low-pressure area of Luzon of the 29th moved on the 30th to the China Sea, where it developed into a depression or typhoon near the Paracels and probably filled up on September 2 near the Indo-China coast.

The first Pacific typhoon was probably formed on the 9th to 11th near 140° longitude E. and 15° latitude N. It moved first to NNW. and N. by W. and was met by the Japanese transport *Ondo* on her way from Tokio to Borneo, when she was in 134° 40′ longitude E. and 24° 30′ latitude N., her barometric minimum being 732 mm. (28.82 inches) at 8 a. m. of the 14th, and the winds blowing with hurricane force (11 Beaufort scale) from N. by E. While the barometer was rising after 8 a. m., the winds backed rapidly to NW., WNW., W., and WSW.

The typhoon moved practically to the north on the 16th and the morning of the 17th. After noon of the 17th it moved northeastward across the Sea of Japan. At 6 a. m. of the 17th the typhoon was over southwestern Japan. The approximate positions of the center at 6 a. m. of the 14th to 18th were as follows:

	Latitude	Longitude
	° ′	°
Aug. 14, 6 a. m.	24 05 N.	135 00 E.
Aug. 15, 6 a. m.	26 30 N.	134 20 E.
Aug. 16, 6 a. m.	29 10 N.	133 50 E.
Aug. 17, 6 a. m.	35 00 N.	133 10 E.
Aug. 18, 6 a. m.	44 40 N.	138 35 E.

The second Pacific typhoon appeared on our Weather Maps of the 17th to the ENE. of Guam, near 150° longitude E. and 17° latitude N. It moved W. by N. until the 23d, when it recurved to NNE. near 138° longitude and 19° latitude, increasing considerably its rate of progress after two days of a very slow movement. At 6 a. m. of the 24th its center was shown in our Weather Map about 115 or 120 miles to the west of the Bonins, where the barometer had fallen to 740 mm. (29.13 inches), with southeasterly winds, force 6. During the 24th and 25th the typhoon moved to NNW. and NW.; on the 26th it took again a NNE. direction and in the morning of the 27th it traversed central Japan, probably as only a depression and moving N., although in the afternoon of the same day it recurved to ENE., entering again the Pacific on the 28th.

The Formosa typhoon was probably formed on the 22d to 23d about 350 or 400 miles to the east of north Luzon. After remaining almost stationary or moving very slowly to WNW., NW., and N. on the 23d, the 24th, and the morning of the 25th, it increased its rate of progress in the afternoon of the 25th while moving NNE. about 300 miles to the east of Bashi Channel. But in the afternoon of the 26th it took almost suddenly a WNW. direction toward Meiacosima group of Islands and north Formosa. Its center passed over Meiacosima in the early morning of the 27th and very close to north Formosa in the afternoon of the same day. Two steamers were much involved in this typhoon near Formosa in the northern part of Formosa Channel—the Japanese steamer *Mayebashi Maru*, with barometric minimum 737.09 mm. (29.06 inches), wind NW. 10, at 3 p. m. of the 27th, in 120 34′ longitude E. and 25 24′ latitude N., and the American steamer *President Jefferson*, with a barometric minimum 743.75 mm. (29.28 inches), wind

NW. 8 at 2 p. m. of the 27th in about 120° 28′ longitude E. and 25° 43′ latitude N.

The approximate position of the center at noon of the 27th was 122° 20′ longitude E., 25° 20′ latitude N. Once in China the typhoon recurved to the north and northeast on the 28th and 29th to the west of Shanghai and on the 30th it traversed Korea and the Sea of Japan, moving ENE.

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

The month like its immediate predecessor was on the whole warm and dry. In the Southeast, the Southwest, and locally in some of the North Central States the drought of July was intensified with the result that a serious situation with respect to water for stock and even for domestic purposes obtained in many localities. The usual details follow.—*A. J. H.*

CYCLONES AND ANTICYCLONES

By W. P. DAY.

Low-pressure areas were rather numerous, but none were important as storms with the exception of a very small disturbance which passed north of Bermuda on the 19th–20th. The latter attained nearly hurricane intensity over a short path northeast of Bermuda and was still in evidence on the 21st, south of Newfoundland.

High-pressure areas were about normal in number, but the majority, as in the preceding month, were of the so-called Alberta type. Five of the nine that were plotted carried through to the Atlantic coast, causing frequent alternations in temperature.

FREE-AIR SUMMARY

By V. E. JAKL

The average free-air temperatures at the aerological stations show about normal values at all altitudes, except at Ellendale and Due West, where a slight, rather uniform, positive departure with altitude was recorded. (See Table 1.) Free-air temperatures from day to day showed but slight variation, closely following the average daily surface temperatures in that respect. Notwithstanding the unusual dryness over considerable areas represented by aerological stations, relative humidities aloft showed no corresponding deficiency, except at Due West, where they were decidedly below normal at all altitudes observed.

The free-air tables for this month include for the first time meteorological data from airplane observations recently begun at the naval air station at Washington, D. C. (See Table 3.) As this method of observation does not include the recording of wind velocity and direction, that portion of the data in Table 3 pertaining to wind is taken from the results of pilot-balloon observations made simultaneously, or nearly so, at the central office of the Weather Bureau at Washington, D. C., a short distance from the naval air station.

The free-air temperature record for Washington shows an average lapse rate about six-tenths of the dry adiabatic, which was probably about normal, inasmuch as the other aerological stations show the usual lapse rate for the time of year, ranging from slightly less to slightly greater then the value for Washington. The following record of the naval air observation on the 20th may be of interest in connection with the thundershower that followed it in a few hours. The storm occurred soon after the surface wind changed to northwesterly from southerly.

Altitude m. s. l. (meters)	Temperature, ° C.	$\frac{\Delta t}{100\ m.}$	Relative humidity (per cent)	Wind direction	Wind velocity (m. p. s.)
7	27.2		69	SSW.	1
408	29.0	−0.45	48	WSW.	9
1,685	17.3	0.92	85	WNW.	7
3,066	9.7	0.55	36	WNW.	13
3,375	7.9	0.58	44	WNW.	15

Due West shows the only important exception to a general state of normal winds for the month, the records of that station giving resultant winds of northeasterly component up to about 1,500 meters, as distinguished from the normal condition of northeasterly winds at the surface only. These northeasterly winds of moderate depth were the effect of a predominant pressure condition over Due West consisting of HIGHS with centers to the north and northeast. As a result dry weather continued over Due West with but little interruption.

At Ellendale on the 23d the highest surface temperature of record for August occurred at the afternoon maximum, although the record high temperature for August at 1,000 to 2,500 meters above sea level occurred in the early morning of that date. The rise of temperature to the high maximum in the lowest few hundred meters was accomplished by a few hours of insolation, aided by the strong chinook wind which blew during the morning in question and probably also during the preceding night. The influence of the chinook was strong aloft during the night, but it seems to have been largely offset at the surface by radiation. The development of the high surface temperature in this case differs from that noted for Broken Arrow in the June, 1925, Free-Air Summary, where the heating was attributed to the cumulative effect of insolation in connection with light winds to great heights. A LOW was centered north of Ellendale on the 22d and west of it on the 23d.

Altitude, m. s. l. (meters)	Temperature, °C.	Relative humidity (per cent)	Wind		Temperature, °C.	Relative humidity (per cent)	Wind	
			Direction	Velocity			Direction	Velocity
	Aug. 22				Aug. 23			
Surface (444)	18.5	70	S.	9	22.0	76	SSE.	8
1,000	21.4	39	SSW.	10	32.4	22	SW.	22
2,000	20.8	23	WSW.	8	23.8	21	SSW.	19
3,000	11.6	23	SW.	6	14.2	43	SSW.	16

The kite flight at Drexel on the 18th is an illustration of change in wind direction at the surface and aloft attending the passage southeastward over the station of the center of a weak low-pressure area. The inversion above 1,000 meters due to colder northeast wind underneath is apparent from the figures; also the change to a